Association between hypertension and insulin resistance in non-diabetic adult populations: a community-based study from the Iran

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Abstract

Background and objectives: High blood pressure increases the probability of insulin resistance and hyperinsulinemia. Also, insulin resistance can be defined as a risk factor for hypertension. The present study investigated the relationship between hypertension and insulin resistance in non-diabetic participants who were referred to Qazvin Metabolic Diseases Center.

Material and methods: In this cross sectional study, 1103 participants (111 non-diabetic with newly diagnosed hypertension and 992 normotensive subjects aged ≥ 20 years) were enrolled from September 2014 to April 2016 in Qazvin (Iran). Systolic and diastolic blood pressure, insulin resistance, waist circumference, body mass index, triglycerides, cholesterol, LDL-cholesterol, fasting blood glucose (FBG) were measured. Fasting triglyceride to high-density lipoprotein cholesterol ratio (TG/HDL-C) was used as a surrogate of insulin resistance. Data were analyzed using SPSS software and $p < 0.05$ was assumed as significant level.

Results: Ten percent of all participants had hypertension. TG/HDL-C was 3.78 ± 3.28 in non-HTN and 5.76 ± 5.35 in HTN participants ($p < 0.001$). The frequency of all cardio-metabolic risk factors (except HDL cholesterol level) was higher in hypertensive group, after adjusting for age and gender ($p < 0.001$).

Conclusion: Based on these results, essential hypertension is associated with a higher prevalence of hyperinsulinemia and insulin resistance in the non-diabetic community in Iran.

Key words: hypertension; insulin resistance; non-diabetic

Arterial Hypertens. 2020, vol. 24, no. 4, pages: 159–166
DOI: 10.5603/AH.a2020.0020

Introduction

Hypertension (HTN) is one of the most important and constantly increasing global health problems [1]. Hypertension is a well-known modifiable risk factor for cardiovascular diseases, chronic renal failure, stroke, and a high morbidity rate [2]. Cardiovascular diseases affect more than 1 billion people worldwide. They are responsible for more than 10 million preventable deaths globally each year [3]. A linear association is between cardiovascular and cerebrovascular events with a wide spectrum of blood pressure elevation in clinical presentation severity. In subjects aged between 40 and 70 years,

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